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EXAMINER	
SMITH, CAROLYN L	

ART UNIT	PAPER NUMBER
1631	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/919,739	Applicant(s) EGAN ET AL.	
	Examiner Carolyn L Smith	Art Unit 1631	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 July 2003* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *3-8* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *3-8* is/are rejected.

7)☒ Claim(s) *3* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *6* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Applicant's amendments and remarks in Paper No. 7, filed 7/18/03, are acknowledged. Amended claims 3 and 5 and canceled claims 17 and 18 are acknowledged.

Applicant's arguments, filed 7/18/03, have been fully considered but they are not deemed to be persuasive. Rejections and/or objections not reiterated from the previous office actions are hereby withdrawn. The following rejections and/or objections are either reiterated or newly applied. They constitute the complete set presently being applied to the instant application.

Claims 3-8 are herein under examination.

Claim Objections

Claim 3 is objected to because of the following informalities: On line 7, the word "on" is missing an "e" as previously stated in original claim 3. The current use of the word "on" does not make grammatical sense in this sentence. Appropriate correction is required. This objection is necessitated by amendment.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

The rejection of claims 3-8 is maintained under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. The claims are drawn to a mathematical

algorithm which is considered non-statutory subject matter. As stated in the MPEP § 2106 IV(B)(1):

> If the "acts" of a claimed process manipulate only numbers, abstract concepts or ideas, or signals representing any of the foregoing, the acts are not being applied to appropriate subject matter. Schrader, 22 F.3d at 294-95, 30 USPQ2d at 1458-59. Thus, a process consisting solely of mathematical operations, i.e., converting one set of numbers into another set of numbers, does not manipulate appropriate subject matter and thus cannot constitute a statutory process.

Applicants state that claims directed to processes manipulating data representing physical objects or activities are proper statutory subject matter as stated in M.P.E.P. § 2106(IV)(B)(2)(b)(i). This is found unpersuasive as Applicants fail to note the entire context of this section. M.P.E.P. § 2106(IV)(B)(2)(b)(i) which states the following:

> Another statutory process is one that requires the measurements of physical objects or activities to be transformed outside of the computer into computer data (In re Gelnovatch, 595 F.2d 32, 41 n.7, 201 USPQ 136, 145 n.7 (CCPA 1979) (data-gathering step did not measure physical phenomenon); Arrhythmia, 958 F.2d at 1056, 22 USPQ2d at 1036), where the data comprises signals corresponding to physical objects or activities external to the computer system, and where the process causes a physical transformation of the signals which are intangible representations of the physical objects or activities. Schrader, 22 F.3d at 294, 30 USPQ2d at 1459 citing with approval Arrhythmia, 958 F.2d at 1058-59, 22 USPQ2d at 1037-38; Abele, 684 F.2d at 909, 214 USPQ at 688; In re Taner, 681 F.2d 787, 790, 214 USPQ 678, 681 (CCPA 1982).

The instant claims as stated do not satisfy this requirement as they make no mention of events occurring inside or outside of a computer. In the instant invention, the sole manipulation of data from physical objects or activities fails to provide subject matter outside of the described manipulation process and therefore renders the claims to be directed solely to non-statutory subject matter.

Claims Rejected Under 35 USC § 112, first paragraph

The following is a quotation of the first paragraph of 35 U.S.C. § 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

LACK OF WRITTEN DESCRIPTION

Claims 5-8 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor, at the time of the invention was filed, had possession of the claimed invention.

Applicants did not point to any support for amended claim 5 regarding the phrase "at least some" (line 15). Written basis is provided for repeating the process for all of the marker molecules (page 12, line 26), but not for the narrowly mentioned amendment of the repeating process for "at least some" of the molecules as now stated in claim 5. Because the introduction of "at least some" lacks written basis for amended claim 5, as filed in Paper No. 7 on 7/18/03, it is considered NEW MATTER.

Claim Rejections – 35 USC §102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The rejection of claims 3-8 is maintained under 35 U.S.C. 102(b) as being anticipated by Stanton et al. (J. Chem. Inf. Comput. Sci. 1999, Vol. 39, pages 21-27). This rejection is maintained and reiterated for reasons of record.

Applicants state Stanton et al. do not teach identification or manipulation of marker molecules and define "marker molecules" to mean molecules of known behavior to which a molecule of unknown behavior can be compared structurally for predicting behavior. This is found unpersuasive as Stanton et al. select molecules which contain certain properties so that behavior is identified, such as antibacterial activity (see discussion below). As stated in the previous Office action, Stanton et al. state that analysis is applied to select additional compounds (abstract, lines 7-8) and state the idea of selecting representatives from each class (page 21, col. 1, lines 7-11).

Applicants state the objectives of the Stanton et al. reference and the instant invention differ. This is found unpersuasive as it is not necessary that the objectives are identical, rather that the claim limitations read upon the prior art reference.

Applicants state Stanton et al. suggest testing other molecules relates to merely testing other compounds in the same structural class as the "hit." Applicants state Stanton et al. merely teaches conventional medicinal chemistry and not a prediction model. This is found unpersuasive as stated in the previous Office action, Stanton et al. disclose programs of drug discovery featuring the selection of molecules (drug candidates) including structural relationship analysis (abstract) that identifies leads for drug candidates which is a form of predictive model as it predicts potential leads.

Applicants state various limitations of claim 5 support novelty over the prior art of record. This is found unpersuasive as each limitation was reasonably broadly interpreted and disclosed by Stanton et al., as described infra.

Stanton et al. disclose that the objective of drug discovery screening programs is to identify hits, or a selection of molecules, to provide a preliminary understanding of the structure-activity relationship between a set of compounds and a target (page 21, col. 1, lines 1-15). Stanton et al. disclose the necessity of the program to evaluate large databases (sets) with molecular descriptors in order to select those that produce chemistry spaces general enough to study large and diverse subsets of chemical structures and still be able to identify subtle differences between highly similar substances (page 21, col. 1, lines 25-33). Stanton et al. disclose programs which identify leads for potential drug candidates (abstract, lines 1-2). For example, Stanton et al. disclose subsets of a set of compounds from a larger combinatorial library used in assays to identify compounds with antibacterial activity (page 22, col. 2, lines 11-28). Thus, the hits in these subsets function as molecular markers which are reasonably interpreted as things that mark or indicate a concept or trait, such as antibacterial activity (page 22, col. 2, lines 13-14). Stanton et al. disclose examples of various properties to examine involving protein binding such as inhibition of bacterial cell growth, metabolic pathways, and isolated enzymes (page 23, col. 2, lines 1-5) so that selected molecules which indicate the presence of these properties would be considered markers of the properties. As mentioned above, Stanton et al. disclose an example of using the property of antibacterial activity (page 22, col. 2, lines 11-14) in a study, starting with a large combinatorial library (10,000 compounds), finding 212 hits (which represents the classification of a set of reference molecules as stated in

claim 3), performing a hierarchical cluster analysis (Figure 1), using a cutoff point (threshold) to yield seven subsets (which represents subset selection as stated in claim 3), and then conducting further studies on representatives in the subsets (which represents the selection of marker molecules from the subset in claim 3) (page 22, col. 2, lines 10-28). Stanton et al. disclose the use of molecular and biological descriptors when doing cluster analysis (page 22, col. 1, lines 16-24). Stanton et al. disclose cluster analysis resulting in dendrograms which were examined visually to determine cut-off thresholds for appropriate levels of similarity (page 21, col. 2, lines 24-26 and Figure 1) to further narrow down the selection of molecules as stated in claim 3. Stanton et al. disclose the goal of producing sufficient data for each class of hits (subsets) to make decisions regarding potential leads (page 21, col. 1, lines 15-18 and page 22, col. 2, line 1), such that selection of the potential leads within the subset are the selected marker molecules as stated in claim 3. Stanton et al. disclose the cluster analysis methods provide a rapid way to reducing large sets of hits into smaller manageable structural classes (page 22, col. 2, lines 1-5). Stanton et al. disclose an example where three subsets were clearly visible in the resulting dendrogram (page 22, col. 2, lines 29-41 and Figure 2) from which compounds were selected for follow-up work from each class as stated in claim 3. Stanton et al. disclose the molecular structure descriptors were taken from BCUT metrics which form a particular chemistry space in order to perform hierarchical cluster analysis, including a similarity metric which was predefined to be based on the squared Euclidean distance (page 21, col. 2, lines 9-23) as stated in claim 5. Stanton et al. disclose the activity of five related hits and each compound's Euclidean distance from the original query (page 24, col. 1, lines 37-41). Stanton et al. disclose nearest-neighbor (NN) searches (page 21, col. 2, lines 27-29) that included the query compounds as well as the

compounds from databases to calculate BCUT metrics (page 22, col. 1, lines 1-3). Stanton et al. disclose the 20-30 closest neighbors to a given query were selected from multiple databases for subsequent screening (page 22, col.1, lines 4-5) which is reasonably interpreted that the counting step was repeated producing varying results (20-30 results) as stated in claim 5. Stanton et al. disclose that the hit rate can be controlled by altering assay conditions used or setting rigorous criteria of a specific property (i.e. 80% inhibition instead of 50%) as well as looking at a broad range of hits (page 22, col. 1, lines 32-36) which is reasonably interpreted as repeating the count process with various thresholds as stated in claims 5, 6, and 7. Stanton et al. disclose some subsets at 100% similarity in Figure 2 which represent a minimum distance as well as the most accurate of predictions as seen in the dendrogram as stated in claims 7 and 8. Stanton et al. disclose the final six best hits (markers) out of 210 compounds, which represent the most accurate hits from the original subset (Table 1 caption). Stanton et al. disclose an example of nearest neighbor analysis of a first molecule that is used to identify sets of potentially active compounds that are similar to the first molecule (page 24, col. 1, lines 29-37 and Table 1). Stanton et al. disclose in Figures 5a and 5b the sorting of molecules (210 total, see Table 1 caption) in a set in descending order of numerical similarity (based on Euclidean distance) to the original query where one can visually determine the number of molecules in between the first molecule and another molecule at a particular NN distance away as stated in claim 5. Stanton et al. disclose using active compounds as starting points to screen other compounds for similarity using a threshold of <= 50 μM as the threshold cut off value (page 24, col. 2, lines 8-16). Stanton et al. disclose a fractions-correctly-predicted metric in Table 2 (last column) where the number of molecules in the range which are also part of the subset (third column) are divided by

the total number of molecules in the range (second column) to give the metric expressed as a percent in the fourth column (page 25, col. 1-2 and Figure 5). Stanton et al. disclose a threshold of a NN distance of 1.9 or less in order to find a 20% hit rate (page 26, col. 1, lines 6-11).

Thus, Stanton et al. anticipate the limitations in claims 3-8.

Conclusion

No claim is allowed.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Papers related to this application may be submitted to Technical Center 1600 by facsimile transmission. Papers should be faxed to Technical Center 1600 via the PTO Fax Center located in Crystal Mall 1. The faxing of such papers must conform with the notices published in the Official Gazette, 1096 OG 30 (November 15, 1988), 1156 OG 61 (November 16, 1993), and

1157 OG 94 (December 28, 1993) (See 37 CFR §1.6(d)). The CM1 Fax Center number is either (703) 308-4242 or (703) 305-3014.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Carolyn Smith, whose telephone number is (703) 308-6043. The examiner can normally be reached Monday through Friday from 8 A.M. to 4:30 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Woodward, can be reached on (703) 308-4028.

Any inquiry of a general nature or relating to the status of this application should be directed to Legal Instruments Examiner Tina Plunkett whose telephone number is (703) 305-3524 or to the Technical Center receptionist whose telephone number is (703) 308-0196.

September 11, 2003

ARDIN H. MARSCHEL
PRIMARY EXAMINER